CLAIMS

1. A wireless communication apparatus for performing data communication under a back scattering system using reflection of incoming radio waves, said wireless communication apparatus comprising a data transmission unit comprising:

an antenna for receiving an incoming radio wave from a data transfer destination;

as many as n signal channels wherein a k-th signal channel gives a phase difference of $(k-1)\lambda/2^{n-1}$ for one-way wave passage therethrough, where $1 \leqq k \leqq n$; and

reflected wave forming means for forming reflected waves with as many as n different phases, by selecting any one of said signal channels in keeping with outgoing data;

wherein said data transmission unit forms said outgoing data using a phase difference pattern of said reflected waves with regard to said incoming radio wave.

2. A wireless communication apparatus according to claim 1, further comprising a first through an (n-1)th phase shifter each giving a phase difference of $\lambda/2^{n+1}$ for one-way wave passage therethrough, the phase shifters being connected in series to said antenna;

wherein said n signal channels comprise a first

signal channel for acquiring a first reflected wave by getting said incoming radio wave directly reflected without wave passage through any of said phase shifters, and a k-th signal channel for acquiring a k-th reflected wave having a phase shifted by $(k-1)\pi/2^{n-1}$ relative to the phase of said first reflected wave through two-way wave passage between said first phase shifter and a (k-1)th phase shifter, where $1 \leqq k \leqq n$; and

wherein said reflected wave forming means performs $2^n$ phase PSK modulation by dividing said outgoing data into increments of $2^{n-1}$ bits each and by assigning phases to the reflected waves through selection of a signal channel in keeping with combinations of 0's and 1's in the $2^{n-1}$ bits.

3. A wireless communication apparatus according to claim 2, further comprising a first through an n-th reflection point located between said antenna and said first phase shifter, between said (k-t)th phase shifter and said k-th phase shifter where $2 \leqq k \leqq n-1$, and downstream of said (n-1)th phase shifter;

wherein said reflected wave forming means performs $2^n$ phase PSK modulation by dividing said outgoing data into increments of $2^{n-1}$ bits each and by assigning phases to the reflected waves through switching of said

reflection points in keeping with combinations of 0's and 1's in the $2^{n-1}$ bits.

4. A wireless communication apparatus according to claim 3, wherein each of said reflection points is formed either by grounding or by use of an open termination.

5. A wireless communication apparatus according to claim 1, further comprising a first through a third phase shifter each giving a phase difference of $\lambda/8$ for one-way wave passage therethrough, the phase shifters being connected in series to said antenna;

wherein said n signal channels comprise: a first signal channel for acquiring a first reflected wave by getting said incoming radio wave directly reflected without wave passage through any of said phase shifters; a second signal channel for acquiring a second reflected wave having a phase shifted by $\pi/2$ relative to the phase of said first reflected wave through two-way wave passage through said first phase shifter alone; a third signal channel for acquiring a third reflected wave having a phase shifted by $\pi$ relative to the phase of said first reflected wave through two-way wave passage through said first and said second phase shifters; and a fourth signal channel for acquiring a fourth reflected wave having a phase shifted by $3\pi/2$ relative to the phase of said first

reflected wave through two-way wave passage through said first through said third phase shifters; and

wherein said reflected wave forming means performs QPSK modulation by dividing said outgoing data into increments of 2 bits each and by assigning phases to the reflected waves through selection of a signal channel in keeping with combinations of 0 and 1 in the 2 bits.

6. A wireless communication apparatus according to claim 5, wherein said reflected wave forming means performs PSK modulation using solely said first and said third signal channels.

7. A wireless communication apparatus for performing data communication under a back scattering system using reflection of incoming radio waves, said wireless communication apparatus comprising a data transmission unit comprising:

an antenna for receiving an incoming radio wave from a data transfer destination;

a first reflected signal channel made of a first radio frequency switch;

a second reflected signal channel made of phase modulating means giving a phase difference of $\lambda/8$ and a second radio frequency switch;

serial/parallel converting means for converting

outgoing data from serial form into a parallel signal; and

synthesizing/distributing means for distributing said incoming radio wave coming from said antenna to the reflected signal channels and for synthesizing outputs from said reflected signal channels;

wherein activation and deactivation of each of said radio frequency switches are controlled using two data items constituting the data having undergone the serial/parallel conversion, so that said data transmission unit forms said outgoing data using a phase difference pattern of the reflected waves with regard to said incoming radio wave.

8. A wireless communication apparatus according to any one of claims 1 through 7, further comprising a data reception unit constituted by a filter for allowing said incoming radio wave received by said antenna to pass on a predetermined frequency band, and by a data reception unit comprising a wave detection unit for forming a signal;

wherein said data transmission unit and said data reception unit are switched alternately depending on whether or not said outgoing data is transmitted.